

REMARKS

Claims 1-32 are pending. The Examiner stated that claims 10, 14-16, and 30-32 are allowed, but rejected claims 1-5, 11-13, 17-21, and 27-29 under § 103. The Examiner also objected to claims 6-9 and 22-26.

Applicants acknowledge and appreciate the indication of allowability of claims 10, 14-16, and 30-32. Applicants request that claims 1-9, 11-13, and 17-29, as amended, also be allowed for the reasons set forth below.

No new matter is added by the amendments to claims 10 and 26, wherein “lest” was changed to “least” to correct a typographical error in each of those claims. It is clear from the context of the language where the misspellings occurred that Applicants’ use of “lest” instead of “least” was a typographical error in both claims.

The § 103 Rejection

The Examiner rejected claims 1-5, 11-13, 17-21, and 27-29 under § 103(a) as being unpatentable over Ikeda, *et al.* (U.S. Pat. No. 5,014,631) in view of Przewalski (U.S. Pat. No. 4, 763,583). The Examiner took the position that Ikeda, *et al.* discloses Applicants’ invention substantially as claimed in the rejected claims with the exception of:

feeding a stream of a secondary fuel and a secondary oxidant having a second oxygen concentration greater than or equal to the first oxygen concentration into the second burner, and combusting at least a portion of the secondary fuel with at least a portion of the secondary oxidant, the secondary fuel is a non-solid fuel, feeding a stream of a secondary fuel and a secondary oxidant having a second oxygen concentration greater than or equal to the first oxygen concentration into the second burner, and combusting at least a portion of the

secondary fuel with at least a portion of the secondary oxidant, thereby forming a plurality of secondary products of combustion and a secondary flame, means for feeding a stream of a secondary fuel and a secondary oxidant having a second oxygen concentration greater than or equal to the first oxygen concentration into the second burner, and means for combusting at least a portion of the secondary fuel with at least a portion of the secondary oxidant, thereby forming a plurality of secondary products of combustion and a secondary flame.

For the reasons discussed below, Applicants respectfully disagree with the Examiner's position.

Four of the claims rejected are independent claims -- 1, 11, 17, and 27. Independent claims 1 and 11 are method claims, and independent claims 17 and 27 are system (apparatus) claims. The language in method claim 1 mirrors the language in system claim 17, and the language in method claim 11 mirrors the language in system claim 27. All four of independent claims 1, 11, 17 and 27 are non-obvious and the § 103 rejections of these claims should be withdrawn for the reasons discussed below.

The Examiner concedes that Ikeda, *et al.* does not disclose certain features of the claimed invention, as set forth in the quoted excerpt above from the Office Action. He contends, however, that Przewalski teaches those "missing features" and that it would have been obvious to one of ordinary skill in the art to modify Ikeda, *et al.* by including the missing features allegedly taught by Przewalski. Applicants disagree because Przewalski does not disclose all of the "missing features" noted by the Examiner.

The ignition chamber 14 of the wet waste incinerator 10 of Przewalski is not even a cyclone combustor, but rather a rotary kiln. Furthermore, the rotary kiln has only one "ignition burner" 16. The second burner used in the wet waste incinerator of Przewalski is an "afterburner" 28 and is "disposed in a wall of the combustion passageway 24 adjacent to flue port 22 for injecting heat into the combustion means" (*i.e.*, into "the combustion passageway 24 connected to the flue port 22 and

leading to a combustion chamber 26”). (Column 3, lines 8-19). Therefore, any heat generated by the afterburner 28 (radiant or otherwise) is directed toward the combustion chamber 26, *i.e.*, in a direction away from the ignition chamber 14. Therefore, even if the afterburner was considered to be a second burner combusting a secondary fuel with a secondary oxidant, it does not form a “secondary flame generating a supplemental radiant heat in the barrel of the cyclone combustor.” (Emphasis added). This quoted language appears in independent claims 1 and 17. Similar but slightly different language appears in independent claims 11 and 27 - - “secondary flame generating a supplemental radiant heat in the barrel of the slagging cyclone combustor.” (Emphasis added).

Persons skilled in the art would not even consider combining the rotary kiln of the wet waste incinerator of Przewalski with the cyclone furnace of Ikeda, *et al.* Even when these references are combined, the references do not yield Applicants’ claimed invention.

Moreover, the rejection of claims 1-5, 11-13, 17-21, and 27-29 as being unpatentable over Ikeda, *et al.* in view of Przewalski is improper because there is no teaching, suggestion, or motivation to combine Ikeda, *et al.* with Przewalski to produce Applicants’ claimed invention. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 682, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990); *In re Fritch*, 972 F.2d 1260, 1265-66, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992); *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000). Since the prior art does not suggest the desirability of combining the cited references, the Examiner has not made a *prima facie* case of obviousness.

Furthermore, it is improper to combine the cited references (Ikeda, *et al.* and Przewalski) because those references do not address or solve the problems addressed by Applicants’ claimed invention, nor do the references appreciate the advantages of Applicants’ claimed invention. Therefore, the § 103 rejection of claims 1-5, 11-13, 17-21, and 27-29 based on the combination used

by the Examiner is inappropriate. *See, In re Fine*, 837 F.2d 1071, 1075-76, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988); and *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679, 7 USPQ2d 1315, 1318 (Fed. Cir. 1988) (problem confronted by the inventor must be considered in determining whether it would have been obvious to combine references in order to solve that problem).

For example, Applicants' claimed invention addresses, *inter alia*, the problem of refueling of cyclone combustors with coals that are not amenable to air/fuel-fired cyclone operation due to the inability to maintain a molten slag layer of sufficiently low viscosity to permit continuous slag flow. It also addresses the problem of increasing the range of operating envelope (*e.g.*, firing rate, stoichiometric ratio, coal grind size) of a cyclone boiler without incurring freezing of slag or degradation of boiler efficiency. Other problems addressed by Applicants' claimed invention include minimizing the escape of fine coal particles from the barrel of a cyclone combustor, lowering NO_x emissions in slagging cyclone combustors while minimizing the risk of corrosion within the barrel, and improving unit availability (*i.e.*, on-stream time) by minimizing temperature excursions that result in freezing of the slag. See the Application at page 6, paragraphs [0016] through [0020].

Neither of the cited references addresses the above-stated problems addressed by Applicants' claimed invention. The primary problem addressed by Ikeda, *et al.* is reduction of the erosion of the interior body of a cyclone furnace. Other problems addressed include the collection of fly ash and effective removal of slag. (Column 1, lines 38-46). The problems addressed by Przewalski include reducing the fuel usage and the opacity of off-gas emissions in wet waste incineration. (Column 1, lines 40-52).

Finally, as previously noted, the Examiner has not established a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP 2143.03, citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (C.C.P.A. 1974). Since there are one or more features of Applicants' claimed

invention that would not be obvious to one skilled in the art, the Examiner has not established a *prima facie* case of obviousness. Neither of the cited references (nor any combination of the cited references) disclose those features.

Since independent method claim 1 is non-obvious under § 103 (as the Examiner has not made a *prima facie* case of obviousness with regard to claim 1), dependent claims 2-5 which depend from independent claim 1 also are non-obvious. *In re Fine, supra*. The same is true for dependent claims 12-13 which depend from independent method claim 11. *Id.*

Similarly, since independent system (apparatus) claim 17 is non-obvious under § 103 (as the Examiner has not made a *prima facie* case of obviousness with regard to claim 17), dependent claims 18-21 which depend from independent claim 17 also are non-obvious. *In re Fine, supra*. The same is true for dependent claims 28-29 which depend from independent system (apparatus) claim 27. *Id.*

Accordingly, for all of the above reasons, Applicants respectfully submit that the rejections under § 103 should be withdrawn.

The Objections

Under "Claim Objections," the Examiner stated: "Claim 26 is objected to because of the following informalities: line 25 refers to lest." Applicants have amended claim 26 by changing "lest" to "least." Accordingly, Applicants request that the objection be withdraw and that claim 26 be allowed.

Under "Allowable Subject Matter," the Examiner stated: "Claims 6-9, and 22-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims." Dependent claims 6-9 depend from independent method claim 1, and dependent claims 22-25

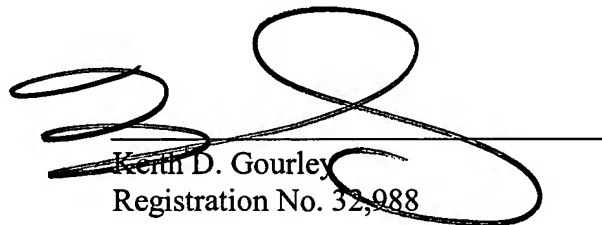
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depend from independent system (apparatus) claim 17. For the reasons stated above, independent claims 1 and 17 are patentable over the art of record and should be allowed. Therefore, dependent claims 6-9, which depend from independent claim 1, and dependent claims 22-25, which depend from independent claim 17, are non-obvious and also should be allowed. *In re Fine, supra*. Accordingly, dependent claims 6-9 and 22-25 should be allowable without rewriting those claims in independent form including all of the limitations of the base claim and any intervening claims. Accordingly, Applicants respectfully request that the Examiner withdraw the objection to dependent claims 6-9 and 22-25.

SUMMARY

For all of the foregoing reasons, Applicants submit that all of the pending claims are patentable over the art of record. Withdrawal of the rejections and objections and an early Notice of Allowance are earnestly solicited.

Respectfully submitted,



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